

# **EXHIBIT D**

ALLERGEN NOMENCLATURE  
TUIS Allergen Nomenclature Sub-Committee

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Plantae Liliopsida Poales Phleum pratense Phl p 4

Allergen Details:

Allergen name:	Phl p 4
Lineage:	Source: <a href="#">Plantae Liliopsida</a> Order: <a href="#">Poales</a> Species: <a href="#">Phleum pratense</a> (Timothy)
MW(SDS-PAGE):	55
Allergenicity:	- 82% of patients tested showed IgE binding to 60 kd Phl p 4 proteins on immunoblot of ragweed pollen extract. IgE binding to nitrocellulose-blotted ragweed pollen extract was inhibited with purified Phl p 4 (2 patients tested) - 75% of grass pollen-allergic patients show IgE binding to Phl p 4 on immunoblot of timothy grass pollen extract. See also medline 96316935
Allergenicity ref.:	<a href="#">1597349</a>
Food allergen:	No
Entry updated on:	13-02-2003

+/-	Isoallergen and variants	GenBank Nucleotide	UniProt	PDB
	Phl p 4.0101	<a href="#">AJ512487</a>	<a href="#">Q5ZQK3</a>	
Amino acid sequence:	SSCEVALSY Y PTPLAKEDFL RCLVKEIPPR LLYAKSSPAY PSVLGQTIRN SRWSSPDNVK PIYIVTPTNA SHIQSAVVC G RRGVRI RVR SGGHDYEGLS YRSLQPEEFA VVDLSKMRAV WVDGKARTAW VDSGAQLGEL YYAIHKASPV LAFPA GVCPT IGVGGNFAGG GFGMLLRKYG IAAENVIDVK LVDANGTLHD KKSMDHDFW AVRGGGESF GIVVAWKVRL LPVPPTVTVF KIPKKASEGA VDIINRWQVV APQLPDDLMI RVIAQGGPTAT FEAMYLGTCT TLTPMSSKF PELGMNASHC NEMSWIQSIP FVHLGHRDNI EDDLNRNNT FKPFAYKSD YVYEPFPKEV WEQIFSTWLL KPGAGIMIFD PYGATISATP EWATFPFHRK GVLFNIQYVN YWFAPGAGAA PLSWSKEIYN YMEPYVSKNP RQAYANYRDI DLGRNEVVND VSTFSSGLVW GQKYFKGNFQ RLAITKGKVD PTDFRNEQS IPPLIQKY			
Sequence reference:	<a href="#">16198308</a>			
Allergenicity:	95% of grass pollen-allergic patients (98 tested) showed IgE binding to Phl p 1 in immunoblot of pollen extract; 97/98 subjects showed IgE binding to rPhl p 1 on nitrocellulose filters.			
Allergenicity ref.:	<a href="#">1597349</a>			
Food allergen:	No			
Original Date:	'Dec 15 2005 1:57PM			
Date Created:	2010-04-29 16:11:59			
Last Updated:	2010-01-27 21:15:36			
	Phl p 4.0201	<a href="#">AJ512488</a>	<a href="#">Q5ZQK4</a>	
Amino acid sequence:	SSCQVAFSYF PPPAAKEDFL GCLVKEIPPR LLYAKSSPAY PSVLGQTIRN SRWSSPDNVK PLYIITPTNV SHIQSAVVC G RRSVRIRVR SGGHDYEGLS YRSLQPETFA VVDLNKMRAV WVDGKARTAW VDSGAQLGEL YYAIHKASPT LAFPA GVCPT IGVGGNFAGG GFGMLLRKYG IAAENVIDVK LVDANGTLHD KKSMDHDFW AVRGGGESF GIVVAWKVRL LPVPPTVTVF KISKTVSEGA VDIINRWQVV APQLPADLMI RTIAQGGPKAT FEAMYLGTCT TLTPMSSKF PELGMNASHC NEMSWIQSIP FVHLGHRDAL EDDLNRNNS FKPFAYKSD YVYQFPKTV WEQILNTWL KPGAGIMIFD PYGATISATP ESATFPFHRK GVLFNIQYVN YWFAPGAGAA PLSWSKDIYN YMEPYVSKNP RQAYANYRDI DLGRNEVVND VSTYASGVW GQKYFKGNFE RLAITKGKVD PTDFRNEQS IPPLIKKY			
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Allergenicity:	95% of grass pollen-allergic patients (98 tested) showed IgE binding to Phl p 1 in immunoblot of pollen extract; 97/98 subjects showed IgE binding to rPhl p 1 on nitrocellulose filters.			
Allergenicity ref.:	<a href="#">1597349</a>			
Food allergen:	No			
Original Date:	'Dec 15 2005 2:04PM			
Date Created:	2010-04-29 16:11:59			
Last Updated:	2010-01-27 21:15:36			

## PubMed

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National Institutes of Health

Display Settings: Abstract

Int Arch Allergy Immunol. 1992;97(4):287-94.

### Diagnosis of grass pollen allergy with recombinant timothy grass (*Phleum pratense*) pollen allergens.

Valenta R, Vrtala S, Ebner C, Kraft D, Scheiner O.

Institute of General and Experimental Pathology, AKH, University of Vienna, Austria.

#### Abstract

In order to establish a test system for grass pollen allergy based on the use of recombinant allergens we chose timothy grass (*Phleum pratense*), a widely spread grass, as a model. From a lambda gt11 cDNA expression library that we had constructed from pollen RNA of timothy grass (*P. pratense*), we had obtained with serum IgE from a grass pollen-allergic individual 60 IgE-binding clones. By differential testing with sera from different grass pollen-allergic patients, we selected three distinct clones encoding Phl p I (group I), Phl p V (group V) and profilin from timothy grass, which when used together allowed the diagnosis of grass pollen allergy in 97 out of 98 tested grass pollen-allergic patients employing a simple plaque lift technique. This recombinant test based on plaque lifts containing allergen-beta-galactosidase fusion proteins was compared with IgE immunoblots using crude pollen protein extracts from timothy grass. Both methods were in good agreement with RAST scores and clinical data, and proofed to be useful for the diagnosis of grass pollen allergy. Our results further indicate that a limited panel of only two recombinant grass pollen allergens, Phl p I and Phl p V, together with the plant panallergen profilin could be sufficient for the diagnosis and possibly immunotherapy of grass pollen allergy.

PMID: 1597349 [PubMed - indexed for MEDLINE]

Publication Types, MeSH Terms, Substances

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